

CLAIMS

We claim:

1. A slide out actuating mechanism for selectively extending and retracting a slidable section of a slide out assembly fixed to a vehicle body, said slide out actuating mechanism comprising:

a first double acting fluid actuated actuator having a first cylinder and an extendible first ram, said first cylinder being fixed relative to one of said vehicle body and said slidable section, and said first ram being fixed relative to the other of said vehicle body and said slidable section;

a second double acting fluid actuated actuator having a second cylinder and an extendible second ram, said second cylinder being fixed relative to one of said vehicle body and said slidable section, and said second ram being fixed relative to the other of said vehicle body and said slidable section; and

at least one flow divider including at least two fluid ports, one of said fluid ports being in fluid communication with one of said first and second cylinders and the other of said fluid ports being in fluid communication with the other of said first and second ports, wherein said flow divider equalizes the flow of fluid flowing through said ports at substantially equal flow rates regardless of the fluid pressure in said first and second cylinders to synchronize movement of said first and second rams when moving said rams relative to said first and second cylinders to move the slide out section of the slide out assembly.

2. The slide out actuating mechanism as in claim 1, in which said slide out assembly includes at least two outer rails fixed relative to the vehicle body and at least two inner rails, each of said inner rails slidably engaging one of said outer rail and fixed relative said slidable section, wherein said first and second double-acting
5 actuators extend and retract said inner rails to extend and retract said slidable section.

3. The slide out actuating mechanism as in claim 1, in which said slide out section is slidably supported above a stationary floor of said vehicle body by a rail fixed to said slide out section and engaging rollers rotatably mounted to a bracket fixed to said stationary floor.

4. The slide out actuating mechanism as in claim 3, in which said extendible ram is connected to said rail, wherein movement of said ram slidably moves said rail relative to said stationary floor.

5. The slide out actuating mechanism as in claim 1, in which said flow divider includes at least two spools disposed in a spool cavity formed in a flow divider body, and each of said fluid ports is in fluid communication with said spool cavity, wherein each of said spools moves in response to a pressure difference between a
5 pressure at one of said fluid ports and a pressure at a third port forming part of said flow divider and in fluid communication with said spool cavity.

6. The slide out actuating mechanism as in claim 1, in which said flow divider includes a pilot operated spool valve.

7. The slide out actuating mechanism as in claim 1, in which the slide out actuating mechanism includes only one flow divider to synchronize movement of said first and second rams when extending and retracting said rams relative to said first and second cylinders to move the slide out section of the slide out assembly.

8. A method of operating a slide out assembly forming part of a vehicle, wherein the slide out assembly includes an actuating mechanism including at least two hydraulic actuators, each of said hydraulic actuators having an extendible ram extendible from a cylinder, said extendible rams being fixed to at least one of a stationary floor and a slide out section, and said cylinders being fixed to the other of
5 said stationary floor and said slide out section, said method comprising:

maintaining a substantially equal flow of fluid flowing into each of said cylinders when extending and retracting said rams regardless of the fluid pressure in each of said cylinders to synchronize the movement of said rams.

9. The method as in claim 8, in which said flow of fluid into each of said cylinders is controlled by at least one flow divider.

10. The method as in claim 9, in which said flow divider includes at least two fluid ports, each of said fluid ports in fluid communication with one of said cylinders, wherein said flow divider maintains the flow of fluid flowing through said ports at substantially equal flow rates to synchronize movement of said rams when
5 extending and retracting said rams relative to said cylinders.

11. The method as in claim 10, in which said flow divider includes at least two spools disposed in a spool cavity formed in a flow divider body, and each of said fluid ports is in fluid communication with said spool cavity, wherein each of said spools moves in response to a pressure difference between a pressure at one of said
5 fluid ports and a pressure at a third port forming part of said flow divider and in fluid communication with said spool cavity.

12. The method as in claim 9, in which said flow divider includes a pilot operated spool valve.

13. A slide out assembly for selectively extending and retracting a slidable portion of a vehicle relative to a stationary portion of the vehicle, said slide out assembly comprising:

a first support member supported by and movable relative to the stationary
5 portion of the vehicle and secured to the slidable portion of the vehicle to extend and retract with the slidable portion of the vehicle, said first support member being extendible and retractable by a first double acting fluid actuated actuator having a first cylinder and an extendible and retractable first ram, said first cylinder being fixed relative to one of said stationary portion and said first support member, and said first
10 ram being fixed relative to the other of said stationary portion and said first support member;

a second support member supported by and movable relative to the stationary portion of the vehicle and secured to the slidable portion of the vehicle to extend and retract with the slidable portion of the vehicle, said second support member being
15 extendible and retractable by a second double acting fluid actuated actuator having a second cylinder and an extendible and retractable second ram, said second cylinder being fixed relative to one of said stationary portion and said second support member, and said second ram being fixed relative to the other of said stationary portion and said second support member;

20 at least one flow divider including at least two fluid ports, one of said fluid ports being in fluid communication with one of said first and second cylinders and the other of said fluid ports being in communication with the other of said first and second ports, wherein said flow divider is responsive to pressures within said

cylinders to equalize the flow of fluid flowing through said ports in response to
25 pressures in said cylinders so as to synchronize movement of said first and second
support members when moving said slide out portion of said vehicle.

14. The slide out actuating mechanism as in claim 13 in which the slide out
actuating mechanism includes only one flow divider to synchronize movement of said
first and second rams when extending and retracting said rams relative to said first and
second cylinders to move the slide out section of the slide out assembly.

15. A method of operating a slide out assembly forming part of a vehicle,
wherein the slide out assembly includes an actuating mechanism including at least two
hydraulic actuators, each of said hydraulic actuators having an extendible ram
extendible from a cylinder, said extendible rams being fixed to at least one of a
5 stationary portion of the vehicle and a slide out section, and said cylinders being fixed
to the other of said stationary portion and said slide out section, on opposite sides of
said slide out section said method comprising:

adjusting flows of fluid flowing to and from each of said cylinders when
respectively extending and retracting said rams in response to fluid pressures in each
10 of said cylinders so as to equalize said flows and synchronize the movement of the
sides of said slide out section.